



# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Push-Type Centrifugal Machine

We, ESCHER WYSS AKTIENGESellschaft, a Swiss Body Corporate, of Hardstrasse 319, Zurich, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a push-type centrifugal machine.

In continuously operating so-called push-type centrifugal machines, the material to be centrifuged is constantly moved towards the outlet end of a perforated drum by an axially reciprocating pusher member. These machines are suitable for use with a wide variety of centrifugable materials, including those of a crystalline nature.

The cases in which the solid crystal mass has to be dissolved directly following the centrifuging process, for example, for refining purposes, are numerous. For this purpose, the crystals pass from the housing of the centrifugal machine by way of conveyor bands, conveyor worms, shaker conveyor troughs, bucket conveyors, pneumatic conveyor installations and the like into dissolving troughs.

Such conveyor arrangements, particularly because they frequently have to be made of special materials, are expensive, cumbersome, limited in their output and cause considerable inconvenience. Furthermore, the power required to drive them is comparatively high, and these installations do not always permit the most favourable arrangements for the manufacturing process.

The present invention has as its aim to obviate these disadvantages. To this end, the dissolving process is transferred into the housing of the centrifugal machine itself. In this way, it is possible to convey the dissolved material by pumps. This is simpler and less expensive than the arrangements mentioned above, and it is possible in this manner to provide practically any suitable arrangement of the plant which is adapted to the manufacturing process.

According to the invention, the push-type centrifugal machine is so constructed that the housing containing the centrifuging drum

contains devices which permit the separated solids to be dissolved in a dissolving liquid.

Such devices may, for example, be provided in such a manner that a container is built into the housing containing the centrifuging drum, the separated solids being collected and dissolved in the said container. However, it is also possible for the centrifuging drum itself to comprise, at the outlet end, an annular chamber in which the separated solids are collected and dissolved. Furthermore, it is also possible to provide an arrangement by means of which dissolving liquid is fed to the solids in the centrifuging drum at the outlet end thereof. In order to obtain the correct concentration of the solution, there may also be provided members which regulate the supply of dissolving liquid to the separated solids and which respond to a variation in the density of the solution. By means of such regulation, it is possible to obtain a constant concentration of the solution even with a variable delivery output of the centrifugal machine.

Three embodiments of the subject of the invention are shown by way of example and in simplified form as axial longitudinal sections in the accompanying drawing, wherein:

Figure 1 is a push-type centrifugal machine, the housing of which has incorporated therein a container in which the separated solids are dissolved;

Figure 2 is a push-type centrifugal machine in which the centrifuging drum comprises an annular chamber in which the separated solids are dissolved; and

Figure 3 is a push-type centrifugal machine in which dissolving liquid is fed to the separated solids whilst in the drum itself.

Figure 1 illustrates a push-type centrifugal machine in which a centrifuging drum 2 with a screen 3 revolves in a housing 1. 4 represents a pusher member which is reciprocated in the drum during the rotation thereof in known manner by means (not shown) and which successively expels the separated solids. Rigidly connected with the pusher member 4 is a funnel 5 to which the material to be centrifuged is supplied through a pipe

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6. The liquid which is centrifuged out passes into a chamber 7 and is discharged through a pipe 8. The solids retained on the drum screen 3 form an annular layer 9 and are displaced outwardly by the movement of the pusher member, whereupon they drop into a container 10 built into the housing 1. In this container, the solids have poured over them a dissolving liquid which is supplied through a pipe 11. A stirrer mechanism 12 provides for a thorough mixing of the liquid and solids. The solution is drawn off through a pipe 13. The housing containing the centrifuging drum therefore contains devices 10, 11, 12 which permit the dissolving of the separated solids in a dissolving liquid, the housing having built therein the container 10 in which the solids being formed are collected and dissolved.

20 In the push-type centrifugal machine which is shown in Figure 2, a centrifuging drum 15 is located in a housing 14. The centrifuging drum 15 comprises at its outlet end an annular chamber 16 in which the separated solids expelled by the movement of the pusher member are collected and dissolved. These solids have dissolving liquid poured thereon, the said liquid being supplied through a pipe 17. The solution flows over an annular weir 18 and is drawn off through a pipe 19.

35 The push-type centrifugal machine illustrated in Figure 3 comprises a housing 22 having two chambers 20 and 21, a centrifuging drum 23 revolving in the said housing. The liquid is centrifuged off into the chamber 20 from the separated solids which form an annular layer 24, the said liquid flowing away through a pipe 25. The push-type centrifugal machine also comprises a device which consists of a sprinkler 26 and by means of which dissolving liquid is supplied to the solids in the centrifuging drum at the outlet end. The solution is centrifuged out into the chamber 21 and is finally discharged through a pipe 27.

45 In addition, means are provided which respond to a variation in the density of the solution and regulate the supply of dissolving liquid to the solids being formed. These means consist essentially of a float 28, a throttle valve 29 and a motor 30 operating the said valve. The supply of current to the motor 30 is effected by way of conductors 31 and 32. The conductor 31 passes directly to the motor, while the conductor 32 leads to a contact plate 34 on a lever 33 connected with the float 28. When the solution flowing from the chamber 21 has the correct density, the float is located in the middle position. The current supply from the conductor 32 to the motor is then interrupted. On the other hand, if the density of the solution

is too low, the float 28 sinks and the contact plate 34 is lifted, so that a connection is produced from the conductor 32 to a conductor 35 feeding the motor. The conductor 35 is so connected to the motor that the latter is turned in the direction in which it moves the throttle valve 29 in the closing direction. The supply of dissolving liquid is therefore reduced and thus the concentration of the solution increased until the density of the solution has again reached the required value, so that the contact plate 34 is returned to the middle position and the current supply to the motor 30 is interrupted.

When the density of the solution is too high, on the other hand, the contact plate 34 is lowered and the supply of current to the motor is effected from the conductor 32 through a conductor 36, which is so connected that the motor is turned in the opposite direction and moves the throttle valve in the opening direction. The supply of dissolving liquid is increased until the density of the solution is again corrected to the rated value.

In the constructional examples which have been illustrated, the housing has two chambers, one for accommodating the liquid to be separated from the centrifuged material and a second chamber for accommodating the solution. However, it is also possible to carry out a treatment of the solids with washing liquid in the centrifuging drum before the dissolving treatment. In such a case, the housing then has further chambers for receiving and discharging the washing liquids.

What we claim is:—

1. A push-type centrifugal machine having a pusher member arranged to reciprocate axially in the perforated centrifuging drum to move the separated solids towards the open end of the drum, characterised in that the housing containing the centrifuging drum has arranged within it devices which permit the separated solids to be dissolved in a dissolving liquid.

2. A push-type centrifugal machine according to Claim 1, characterised in that the housing has built therein a container in which the separated solids discharged from the open end of the drum are collected and dissolved.

3. A push-type centrifugal machine according to Claim 1, characterised in that the centrifuging drum comprises at its open end an annular chamber in which the separated solids are collected and dissolved.

4. A push-type centrifugal machine according to Claim 1, characterised in that it comprises a device by means of which dissolving liquid is supplied to the separated solids in the centrifuging drum at the open end thereof.

5. A push-type centrifugal machine according to Claim 1, characterised in that it comprises means which regulate the supply of the dissolving liquid to the separated solids and which respond to variations in the density of the solution.

6. A push-type centrifugal machine substantially as described with reference to

Figure 1, Figure 2 or Figure 3 of the accompanying drawings.

Dated this 14th day of April, 1953.

For the Applicants,

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Fig. 1

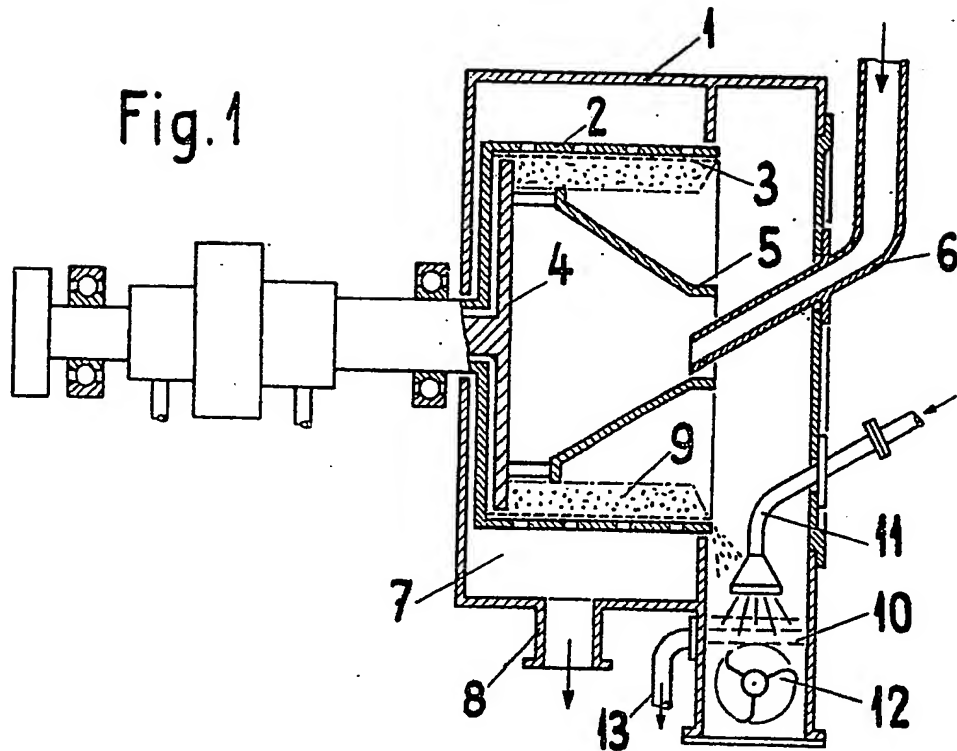
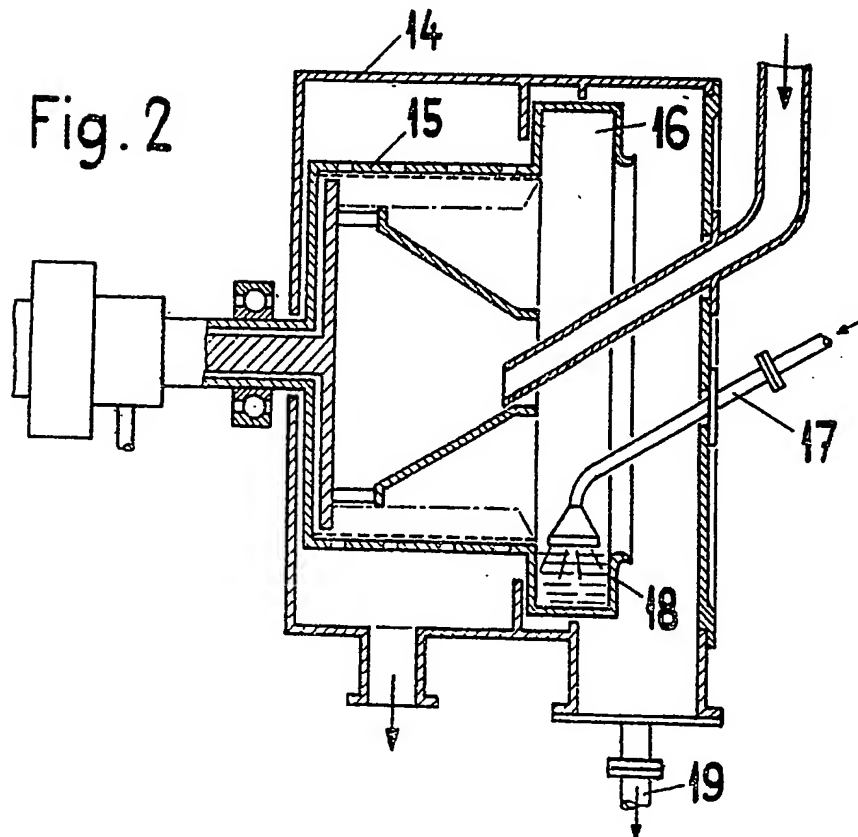


Fig. 2



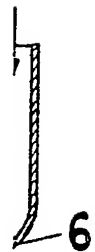
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2 SHEETS

*This drawing is a reproduction of  
the Original on a reduced scale.*

SHEETS 1 & 2

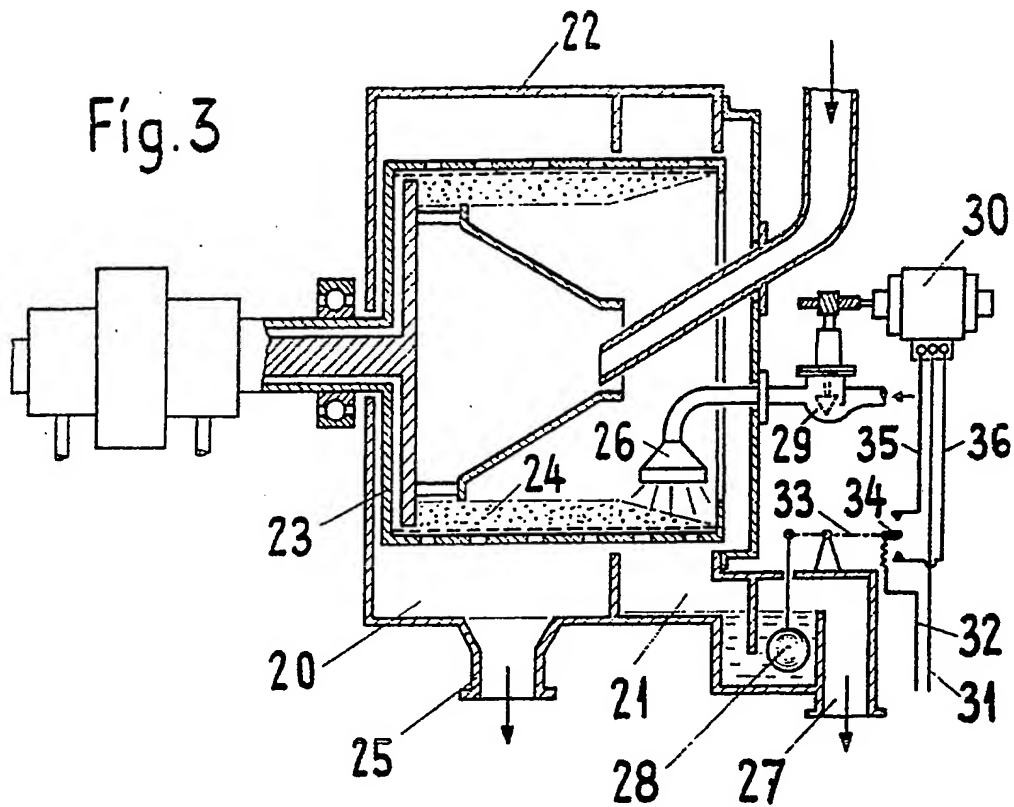


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Fig. 3



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